Survey of Nurse Perceptions Regarding the Utilization of Bedside Computers

Diana Willson, R.N., B.S.N.
Medical Informatics Department, Intermountain Health Care

ABSTRACT

In December 1993, Intermountain Health Care (IHC) placed a moratorium on the installation of bedside computers in the acute care setting unless information could be obtained to justify resumption of these installations. A survey was developed and administered to nurses at two IHC hospitals. The survey results indicate that acute care nurses value bedside computers and believe that IHC should install them at other facilities. In addition, the acute care nurses estimate that they are using the bedside computers over 75% of the time during the day shift to document vital signs/measurements and intake/output quantities. Based on the results of this survey, IHC has decided to continue installing bedside computers in the acute care setting.

INTRODUCTION

Computerizing patient data not only allows for the production of financial and clinical reports, but can assist clinicians with automated decision support capabilities [1]. Patient data collected by nurses and other clinicians is playing an ever increasing role in the automation of real-time alerts and the generation of suggested interventions to improve patient care. Intermountain Health Care is committed to improving patient care and believes that automating the patient medical record is a crucial step in this process. Therefore, IHC is installing the HELP (Health Evaluation through Logical Processing) hospital information system at numerous IHC hospitals.

The question for IHC is where to install computers to optimize the collection of patient data. Bedside computers were installed on all units where the nursing information subsystem of HELP was implemented. The decision to install bedside computers rather than pod or centrally located computers was based on a 1989 study done on an acute care unit at LDS Hospital [2]. This study, designed to measure the impact of bedside computers, concluded that not only did nurses prefer bedside terminals but patient care and the incidence of real-time data entry increased.

In December of 1993, IHC placed a moratorium on the installation of bedside computers on acute care nursing units unless information could be obtained to support their continued installation. This decision was based primarily on the results of a study to measure the impact of the HELP nursing information system on an acute care nursing unit at McKay-Dee Hospital [3]. This study indicates that nurses spend 54% of documentation time at the nurses station and 21% in the patient room. This observed preference for documenting at the nurses station rather than at the bedside was unexpected and raises many important questions about what the computers at the bedside are being used for and when. Are the nurses using the bedside computers only during the day shift? What data are they documenting on the bedside computers? Why are they not using the computers at the bedside? IHC felt that more information about bedside computer use was needed in order to justify the continued installation of bedside computers in the acute care setting. A decision was made to conduct a survey of clinicians who use the bedside computers at LDS Hospital and McKay-Dee Hospital to determine nurse perceptions regarding the utilization of bedside computers.

METHODS

A survey tool was developed to answer the following four questions.

1. Given the cost of installing bedside computers, do the benefits justify their continued installation at IHC hospitals?

The survey question to answer this question is the following: "The initial cost of installing bedside computers is about $2000 per room. IHC would like your opinion as to whether the benefits of bedside computers justifies their continued installation and maintenance costs at IHC hospitals. Please circle your opinion. YES - the value of bedside computers justifies the cost of installation and maintenance. NO - As long as sufficient numbers of computers are available elsewhere, bedside computers are not necessary."

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2. For specific applications/functions, what percentage of the time do users think they use the bedside computers?

The survey asks the users to indicate on a continuous scale (0=never, 100=always) the amount of time they use the bedside computer for various functions and to indicate if there is a difference between day (0700 - 1900) and night (1900 - 0700) shifts. Nine functions are listed on the survey.

3. How strongly do users feel about the reasons for and against using the bedside computers?

The survey asks the users to indicate on a continuous scale (0=never, 100=always) the degree each of the listed reasons influences where they use the computer. There are eight reasons listed for using the bedside computer and ten reasons for using computers not at the bedside.

4. What interventions do the users think would increase their use of bedside computers?

The survey asks, "What changes or interventions could IHC do to increase your use of bedside computers?"

The survey was administered anonymously to users of the bedside computers. At LDS Hospital these users are the nursing staff on the acute care and ICU units (RN's, LPN's, aides, critical care technicians) and respiratory therapists. At McKay-Dee Hospital, these users are the nursing staff on the acute care units and the float nurses. In order to reach the largest number of staff, the survey was administered primarily at the February 1994 staff meetings at LDS Hospital. Several different methodologies of survey administration were used at McKay-Dee Hospital. Out of a possible total sample size of 695 users, 327 were surveyed (47%).

SURVEY RESULTS

The results are presented in categories corresponding to the following four questions. While information was collected from ICU nurses and respiratory therapists, IHC's primary interest and the focus of this paper is the response of the acute care nursing staff (RN's, LPN's, aides).

1. Given the cost of installing bedside computers, do the benefits justify their continued installation at IHC hospitals?

Survey respondents indicate that they place value on bedside computers and are in favor of their continued installation at IHC hospitals. Figure 1 shows the percentage of users responding with a "NO" or "YES" to the question about whether the value of bedside computers justifies the cost of installation. 66% of the acute care nurses at LDS Hospital and 60% at McKay-Dee Hospital indicate that IHC should continue with the installation of bedside computers.

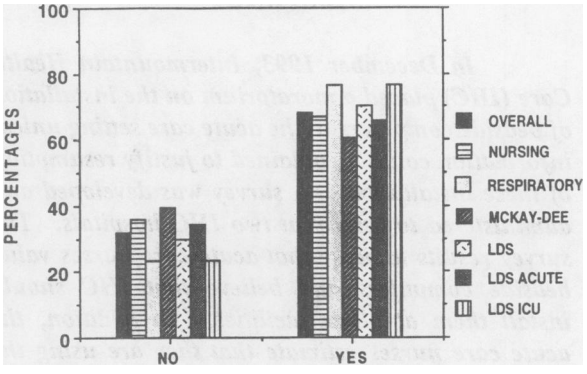

Figure 1. Does the value of bedside computers justify the cost?

2. For specific applications/functions, what percentage of the time do users think they use the bedside computers? The list of functions included in the survey are: chart vital signs/measurements, chart intake/output, chart physical assessment, chart therapy/treatments, edit data, care plans, review charting, review lab/xray results, order entry and other.

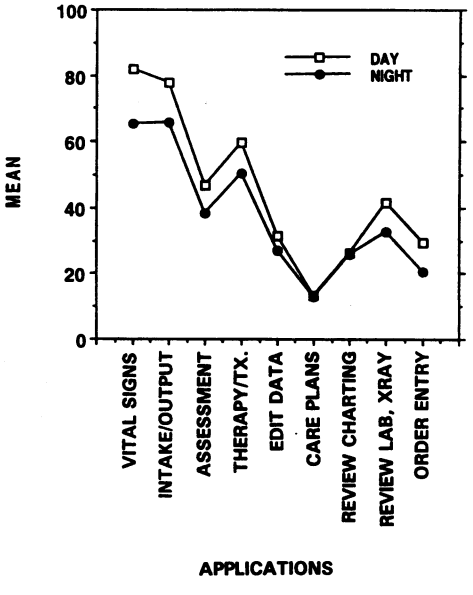

Figure 2. Acute care estimates of bedside computer use for various functions.

Figure 2 shows how acute care nurses at LDS and McKay-Dee Hospitals responded to the question asking them to estimate the percentage of the time they use the bedside computer for various functions and to indicate differences between day (0700 - 1900) and night (1900 - 0700) shifts. During the day, nurses estimate that 82% of vital signs/ measurements, 78% of intake/output quantities and 60% of therapies/treatments are documented on the bedside computer. At night, these estimates decrease somewhat to 65% of vital signs/measurements, 66% intake/output quantities and 50% of therapies/ treatments are documented on the bedside computer.

A comparison was made between those nurses who responded that the value of bedside computers justifies their costs (positive response) with those who responded that bedside computers are not necessary (negative response). Figure 3 shows that those nurses who respond positively to the value of bedside computers consistently indicate they use the bedside computers more than the nurses who feel bedside computers are not necessary.

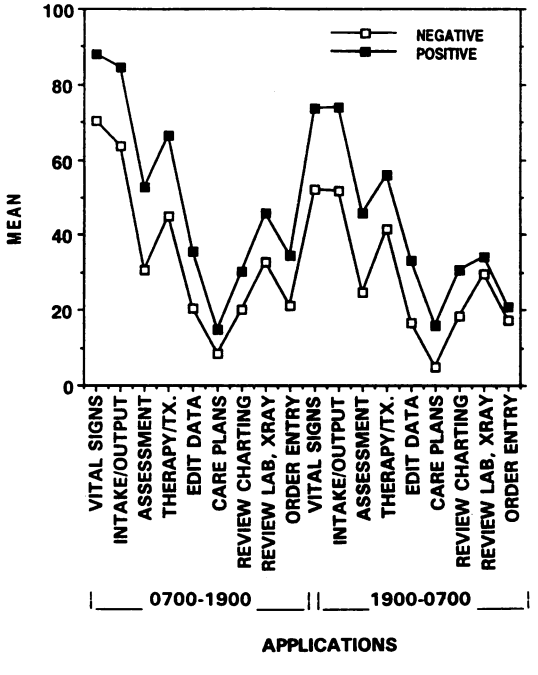

Figure 3. Comparison of acute care nurses who responded positively and negatively to the question about the value of bedside computers.

3. How strongly do users feel about the reasons for and against using the bedside computers?

The reasons listed in the survey for using the bedside computer and the mean scores for acute care nurses are:

1. At the bedside, I can enter patient data immediately as it is gathered. (mean 68)
2. I feel that patient data is more accurate if entered at the bedside. (mean 68)
3. The patient is already identified at the bedside so it saves me keystrokes. (mean 70)
4. It's easier for me to document at the bedside rather than try to remember it. (mean 67)
5. Entering directly into the computer saves me from writing it down first. (mean 63)
6. I like to complete nurse charting in a quiet environment. (mean 70)
7. I can involve the patient in the care giving process while in the room. (mean 59)
8. It saves me time to document at the bedside computer. (mean 64)

The acute care nurses indicate very little difference between these reasons. The mean scores are all grouped between 63 and 70 with the exception or the seventh reason (I can involve the patient in the care giving process while in the room.) with a mean of 59.

The reasons listed in the survey for using computers not at the bedside and the mean scores for acute care nurses are:

1. The computers in the rooms are more frequently "down" or broken. (mean 35)
2. I feel uncomfortable using the computer with family members in the room. (mean 54)
3. I prefer to sit down when I chart. (mean 64)
4. I prefer uninterrupted time to think when I chart. (mean 68)
5. It is too dark in the room to use the bedside computer at night. (mean 53)
6. It's easier to "batch" chart than chart individual items on one patient. (mean 46)
7. Using bedside computers doesn't fit into my work flow. (mean 41)
8. I'm just not in the "habit" of using the bedside computer. (mean 39)
9. I'm at the central station/pod for other reasons so I just chart there. (mean 50)
10. I prefer to be in the company of other nurses at the pod or nurse's station. (mean 36)

Acute care nurses indicate some differences between the reasons for not using the bedside computer. The range of means varies from 35 to 68. The top five reasons for not using the bedside computers are: (1) I prefer uninterrupted time to think when I chart, (2) I prefer to sit down when I chart, (3) I feel uncomfortable using the computer with family members in the room, (4) It is too dark

in the room to use the bedside computer at night, and (5) I'm at the central station/pod for other reasons so I just chart there.

Those nurses who respond that the value of bedside computers justifies their cost (positive response) feel more strongly about the reasons for using the bedside computers and less strongly about the reasons for not using the bedside computers than the nurses who do not think that bedside computers are necessary (negative response) (see Figures 4 and 5).

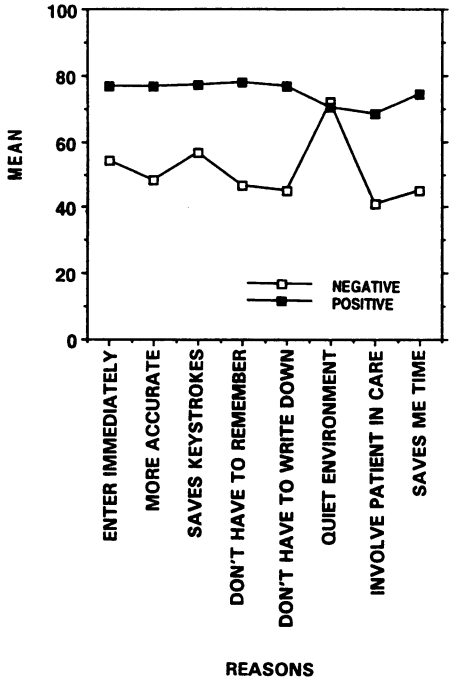

Figure 4. Reasons for using bedside computers.

4. What interventions do the users think would increase their use of bedside computers?

The users' textual responses to this question were coded. Table 1 shows the coded comments that have more than 5 responses.

The nursing staff at LDS Hospital indicate that keeping the computers working and speeding them up are interventions that would increase their use of the bedside computers. While there is some question as to whether the computers at the bedside are really "down" more often and are slower than the computers at other locations, it is obvious that the nurses are concerned about these issues. LDS Hospital is committed to trying to improve these conditions.

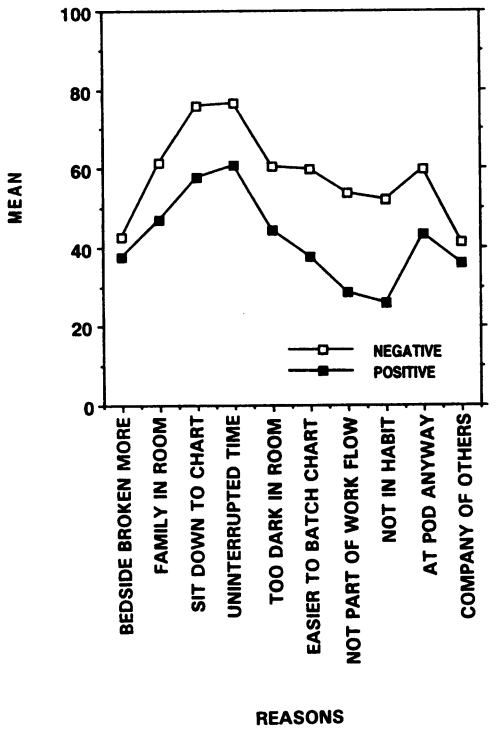

Figure 5. Reasons for not using bedside computers.

Intervention	McKay-Dee only	LDS acute care only
1. Keep them working (repair more quickly, no down time)	1	22
2. Provide stools/chairs	7	10
3. Make them faster (speed them up)	1	9
4. Place them in a better location in room	0	12
5. Nothing	1	11
6. Prefer to chart outside patient room	2	6
7. Provide keyboard light	4	3
8. Shorten password (no sign-on, don't log off)	4	2
9. Decrease the work load	6	0
10. Other	12	9

Table 1. Suggested interventions to increase bedside computer use.

Placing the computers in a better location in the patient room is apparently another LDS Hospital specific issue. Most of the computers in the acute care patient rooms are located at the head of the bed, behind the bathroom door; the computers at McKay-Dee Hospital are located at the foot of the patient's bed. Providing stools/chairs and keyboard lights are suggestions from both hospitals.

DISCUSSION

Intermountain Health Care is committed to the computerization of the patient record for the purposes of providing comprehensive clinical and financial reports, supporting the clinician in decision making, automating alerts and providing other computerized decision support capabilities, and supporting clinical quality improvement and outcome studies. The question for IHC is not whether the data documented by acute care nurses should be computerized, but where should the computers be located. The survey results indicate that acute care nurses value bedside computers and are in favor of their continued installation at IHC hospitals. In addition, the nurses indicate very high use of bedside computers for the documenting of vital signs and measurements, intake and output quantities, and documentation of treatment and therapies. These are the same data elements, with the addition of medications and lab results, that have been identified by physicians at McKay-Dee Hospital as being the crucial ones for clinical decision making and are the most important to be documented "real time" (Mig Neiswanger, Nursing Information Systems Coordinator, McKay-Dee Hospital, personal communication, May 9, 1994). Based on the survey results, IHC decided to lift the moratorium on bedside computers in the acute care settings and to resume installing them at hospitals preparing to implement the HELP nursing information system.

Certainly, there is room for further research. Since the survey was completed, a new version of the nursing documentation software was installed at both LDS and McKay-Dee Hospitals. This software is, for the first time, able to capture with each data element, the user name/ID doing the documenting, which computer is being used, and the actual time that the data is being entered (not just the time the user charts that it is). Future studies should examine what is actually being documented at the bedside, not just the user's perception.

The survey indicates that there are nurses who value the bedside computer and those who do not. Those who are supportive indicate that they consistently use the bedside computers more and feel more strongly about the reasons for using the bedside computers than the nurses who do not feel bedside computers are necessary. What can explain the reasons for this dichotomy? Possibly, the differences can be attributed to nurse attitudes which could be measured with the Nurse Attitude Survey [4].

Based on the survey results, several avenues might be explored to enhance the use of bedside computers: keep the computers functioning and fast, provide stools/chairs for nurses, select optimal placement of computers in the patient room, provide keyboard lights for night-time documentation, and educate nurses as to the data elements that must be entered "real time" to not only assist clinicians in managing patients but to drive the automated decision support capabilities of the information system.

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